MISSOURI VEHICLE STOPS 2020 ANNUAL REPORT

MISSOURI ATTORNEY GENERAL'S OFFICE

Missouri Vehicle Stops 2020 Annual Report

Contents

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As the chief lawyer for the State of Missouri, my job is to protect each and every one of our six million citizens from crime, abuse and fraud, a responsibility I take very seriously. Our government, the shared responsibility between the citizens of our state and the elected officials, must be a framework that preserves all citizens' rights to life, liberty and pursuit of happiness.

The office of the Missouri Attorney General is required, by law, to collect data on the demographics of the traffic stops made by law enforcement officers from across the state, and to report these findings to the Governor and the public. Importantly, this data can help government and law enforcement determine any issues with disparities related to stops and searches.

This report aggregates the traffic stops data from 590 law enforcement agencies across the state, breaking down the data as it relates to race, the number of stops, the search rate, contraband hit rate and arrest rates. In 2019, we identified several changes to questions that officers must answer when making a stop that we believe will make future reports more informative. This includes questions relating to the officer's assignment, the residential zip code of the driver stopped and the reason for issuing a citation or warning. This data will provide more context for the data collected and be fully available in the 2021 report.

As we seek to balance the rights of all citizens of our state with the enforcement of the rule of law, and the brave men and women of law enforcement who put their lives on the line every day to protect us, we will continue to improve this report.

BACKGROUND

Concerns raised by the citizens of Missouri and the Missouri legislature regarding allegations of bias in traffic enforcement prompted the passage of SB 1053 (2000). SB 1053 created Section 590.650, RSMo. which became effective August 28, 2000. This statute created the Vehicle Stops Report and required that the Attorney General's Office collect and report on traffic stops conducted by law enforcement officers across the state of Missouri.

Under § 590.650, RSMo. all peace officers in the state must report specific information, including a driver's race, for each vehicle stop made in the state. Law enforcement agencies must provide their vehicle stops data to the Attorney General by March 1, and the Attorney General must compile the data and report to the Governor, General Assembly, and each law enforcement agency no later than June 1 of each year. The law allows the Governor to withhold state funds from any agency that does not submit its vehicle stops data to the Attorney General by the statutory deadline.

After reviewing analysis of the Vehicle Stops Report (VSR) and conferring with law enforcement leaders across the state in 2019, the Attorney General's Office (AGO) began implementing comprehensive changes to the VSR. These changes will improve the information collected for the report while allowing for a fundamental shift in the level of analysis possible through the VSR. Three new questions have been added to the report that collect information on officer assignment during the stop, the residential zip code of the stopped driver, and the cause of citations and/or warnings issued to the driver. In addition, other questions have been adjusted for clarity or to improve the value of the data collected by adding new response options.

The most significant change to the VSR is the shift toward collecting disaggregated data from across the state. Currently, agencies only report the aggregate numbers of stops meeting the criteria for each question broken down only by the race and ethnicity of the individual involved in the stop. This reporting framework prevents incident-level analyses that could take into consideration other factors such as driver age, driver sex, and time of stop. Multi-variate analysis of incident-level data will significantly improve VSR analysis. To allow for collection of incident-level data, the AGO moved to implement an optional data collection framework that collects all variables for each stop an agency made during the year, rather than just totals by race for each agency. These changes became effective January 2020 and implementation efforts across the state are ongoing.

The benefits of these changes are already manifested in the current VSR, which provides more detail and in-depth analyses than previous reports, while still retaining all information contained in previous versions. The value of improving the VSR's data collection framework can be seen in the results found by simply including drivers' jurisdiction residency status on VSR forms. Analysis of Figure 7 in the appendix reveals that, on average, only 35% of traffic stops conducted by Missouri law enforcement agencies involved residents of their jurisdiction. This reveals a significant weakness in the disparity index, a metric historically central to the VSR, since it uses jurisdictions' resident population as a benchmark for expected traffic stop patterns.

The summary of statewide vehicle stops data has been provided by Dr. Jeffrey Milyo, Professor and Chair of the Department of Economics at the University of Missouri in Columbia; and Dr. Brittany Street, Assistant Professor of Economics at the University of Missouri at Columbia.

STATEWIDE METRICS

This report summarizes traffic stop data from 590 law enforcement agencies in Missouri that reported data for calendar year 2020. Of these, 22 agencies reported no traffic stops during the year. These agencies often contract out traffic enforcement to another agency covering their jurisdictions and focus on other enforcement activities. In total, this report represent 97.7% of the 604 active law enforcement agencies in the state. The statewide data described in this section are also presented in the same manner for each agency in the attached agency reports.

STATEWIDE METRICS CONTINUED

In 2020, the agencies filing reports recorded 1,162,905 vehicle stops, resulting in 95,501 searches and 44,762 arrests. Table 1 provides summary data on stops, searches, arrests, and citations, broken out by race and ethnic group; this facilitates comparisons across groups and over time using past reports. [1] More detailed data on vehicle stops and outcomes of stops are listed in Tables 4 and 5, located at the end of this report. [2]

The 2020 VSR should be viewed in the context of the COVID-19 pandemic, for example, it is very likely that COVID-19 led to a reduction in traffic stops during 2020 as law enforcement sought to minimize inter-person contact, with implications for the reasons officers did decide to conduct stops and searches. COVID-19 also affected the policy threshold for arrests as agencies sought to reduce jail populations to the greatest extent possible. In addition, with stay at home orders in place in many areas of the state, there were simply fewer drivers on the road. Consequently, these factors must be considered when comparing data for 2020 to prior (or future) years. For example, there were almost 24% fewer vehicle stops by police agencies in 2020 compared to the prior year, so that the stop rate per 100 persons – defined as (100 X stops / 2019 population) --- decreased from 32.23 in 2019 to 23.82 in 2020. The stop rate for the White population fell from 29.67 to 22.64, and the stop rate for the Black population fell from 57.7 to 38.77. Further, in 2020, there were 7% fewer searches compared to 2019, but the search rate per 100 stops increased from 6.74 to 8.21. The search rate for the White population increased from 6.74 to 8.30, while the search rate for the Black population fell slightly from 8.86 to 8.55. The total number of arrests declined 40% over the last year; the arrest rate per 100 stops was 4.89 in 2019 and decreased to 3.85 in 2020. The arrest rate for the White population decreased from 4.55 to 3.70, while the arrest rate for the Black population dropped from 6.21 in 2019 to 4.61 in 2020.

[1] Race and ethnicity are recorded based on officer perception at the time of the vehicle stop.
[2] The analysis in the report is based on the aggregated data reported by each agency. Thus, it relies on the assumption of accuracy in the reported data in terms of the tallying of stops and resulting outcomes, the distinction between resident and non-resident drivers, etc.

TABLE 1: RATES BY RACE FOR MISSOURI

	Total	White	Black	Hispanic	Native American	Asian	Other
Population							
2019 Population	4,881,733	3,964,827	539,702	170,858	22,504	99,131	143,442
2019 Population %	100	81.22	11.06	3.5	0.46	2.03	2.94
Totals							
All Stops	1,162,905	897,674	209,222	29,711	1,979	10,349	13,970
Resident stops	589,388	475,184	92,097	12,891	768	4,269	4,179
Searches	95,501	74,478	17,882	2,268	137	304	432
Contraband	28,961	20,275	7,547	798	59	119	163
Arrests	44,762	33,230	9,636	1,427	65	174	230
Citations	548,109	393,395	126,937	16,909	817	5,034	5,017
Rates							
Stop Rate	23.82	22.64	38.77	17.39	8.79	10.44	9.74
Stop Rate, Residents	12.07	11.98	17.06	7.54	3.41	4.31	2.91
Search Rate	8.21	8.3	8.55	7.63	6.92	2.94	3.09
Contraband Hit Rate	30.33	27.22	42.2	35.19	43.07	39.14	37.73
Arrest Rate	3.85	3.7	4.61	4.8	3.28	1.68	1.65
Citation Rate	47.13	43.82	60.67	56.91	41.28	48.64	35.91

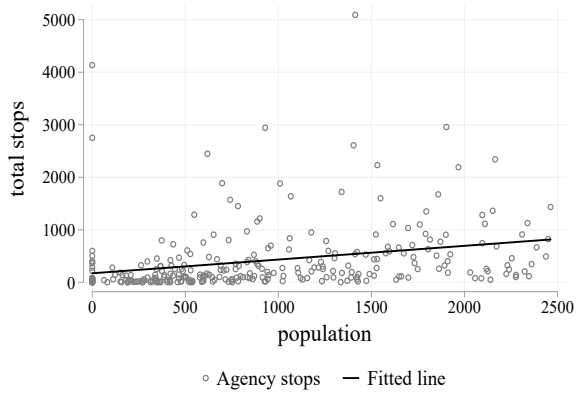
Notes: The American Community Survey five-year population estimates for ages 16+ as of 2019 are used for Missouri. The ACS only provides race-specific Hispanic estimates for White, meaning non-White Hispanic residents are double-counted in the 2019 race percentages above.

Stop rate = (stops / 2019 population) X 100.
Stop rate, residents only = (stops by residents / 2019 population) X 100.
Search rate = (searches / stops) X 100.
Contraband hit rate = (searches with contraband found / total searches) X 100.
Arrest rate = (arrests / stops) X 100.
Citation rate = (citations / stops) X 100.

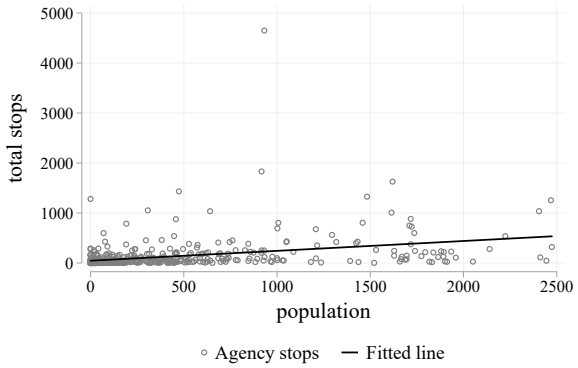
Table 1 also lists the number of traffic stops for residents of the community served by a particular agency. Stop rates are therefore calculated for all stops and for the subset of vehicle stops involving only residents. However, because only aggregate data is required to be reported by agencies, it is not possible to calculate search rates, arrest rates, etc. for residents, nor is it possible to break down the detailed data in Tables 4 and 5 (below) for residents only. In the future, as more agencies report incident-level data, a more detailed breakdown of data by residence will be feasible. For consistency and ease of exposition, all subsequent discussion of these data refers to total vehicle stops by agencies.

FIGURE 1:
TOTAL STOPS ACROSS AGENCIES FOR MISSOURI

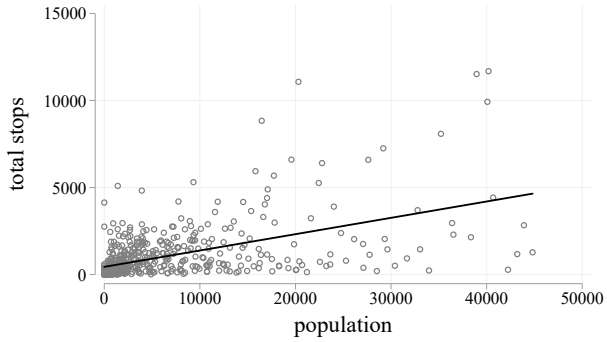
(a) Total stops, pop. below median



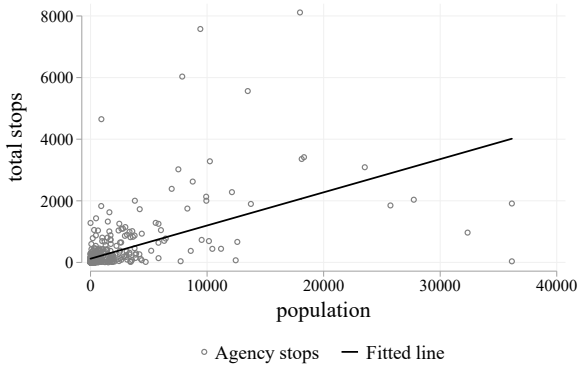
(b) Non-white total stops, pop. below median



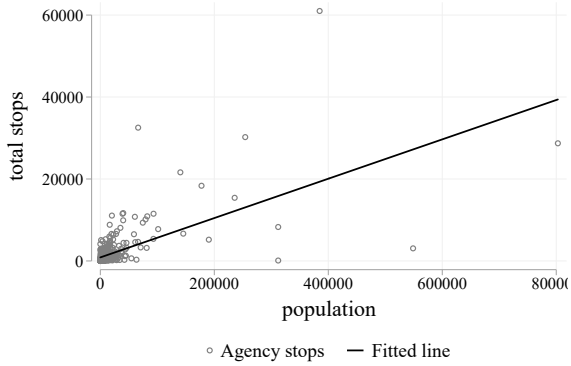
(c) Total stops, pop. below 95th percentile



(d) Non-white total stops, pop. below 95th percentile



(e) Total stops, all



(f) Non-white total stops, all

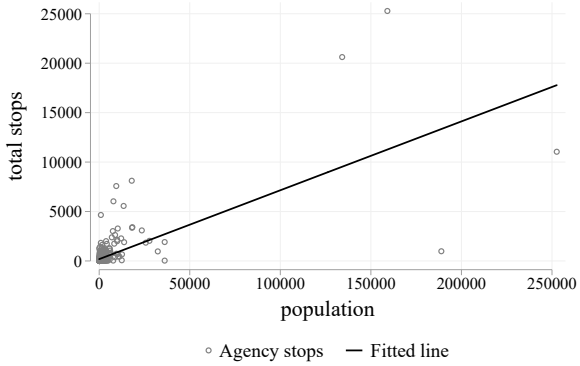


Figure 1 provides more context by comparing traffic stops by agencies to their associated community population for both the total population (left side) and the non-white population (right-side) in each community. For example, the Columbia Police Department is matched to the total and non-white population for the city of Columbia, and so on. Agencies that do not match directly to census geographies, such as university and airport police, are assigned a population of zero.

The panels in Figure 1 are split across three rows according to community size; this facilitates comparisons across agencies serving similar-size communities. The panels in the first row focus only on agencies serving smaller communities (less than median population, or 2,475 persons), while the second row of panels covers agencies serving all but the largest 5% of cities (i.e., communities with less than 46,979 persons) and the last row of panels includes all agencies, except the Missouri State Highway Patrol. Each panel in Figure 1 also includes a "best fit" line that indicates the relationship between stops and population (i.e., the stop rate for the agencies and communities listed in each panel). The agency detailed reports replicate Figure 1 and highlight the location of each agency in this figure, which facilitates comparisons to other agencies.

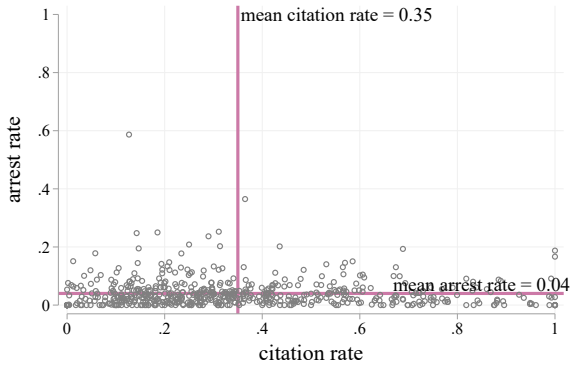
Notes: Figure (a) depicts the total number of stops for all agencies with a total population less than the median population size (2,475 persons) in Missouri plotted against population size. Similarly, Figure (b) shows the total number of non-white stops by the non-white population size for each agency for those same agencies. Figures (c) and (d) follow the same format but for agencies with a total population less than the 95th-percentile (46,979 persons). Finally, graphs (e) and (f) graph all agencies, except the Missouri State Highway Patrol, which covers the entire state. Population is measured using the 2019 American Community Survey 5-year estimates for Missouri. The ACS only provides race-specific Hispanic estimates for Whites. To avoid double counting, we calculate the total non-White population as the total population minus the Non-Hispanic White population for each agency. Agencies without population (e.g., university police) are considered to have a population of zero.

FIGURE 2:

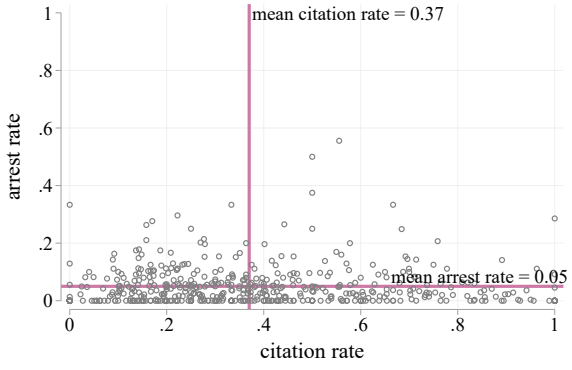
CITATION, ARREST, SEARCH AND HIT RATES ACROSS AGENCIES FOR MISSOURI

Figure 2 describes the other outcomes of interest for vehicle stops (i.e., arrests, citations, searches and the discovery of contraband during a search, or "hits"), by the agency. The data are reported as rates, for all stops (left side) and for only stops involving the non-white population (right side).

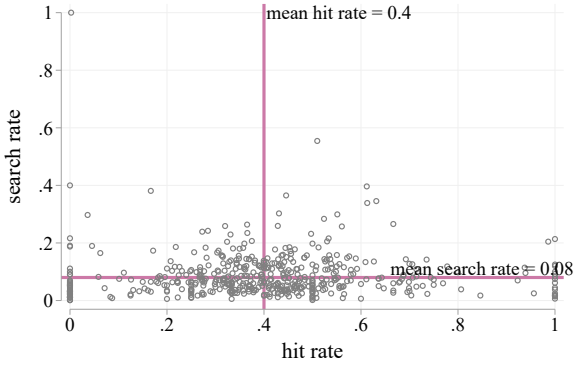
(a) Arrest and citation rate



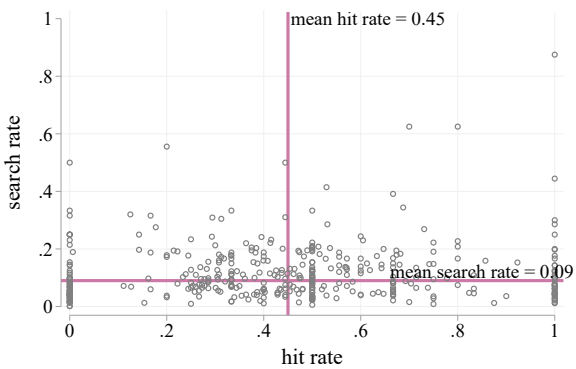
(b) Non-white arrest and citation rate



(c) Search and hit rate



(d) Non-white search and hit rate



Notes: Figure (a) graphs the arrest rate and citation rate for all agencies in Missouri. Similarly, Figure (b) graphs the arrest rate and citation rate for all non-white stops. Figure (c) graphs the search rate and hit rate for all agencies in Missouri. Similarly, Figure (d) graphs the search rate for all non-white stops and hit rate for all non-white searches.

The panels in the first row of Figure 2 show the distribution of agency citation rates and arrest rates per 100 stops compared to the average rates for all agencies. Agencies located in the upper right quadrants of these figures exhibit higher than average arrest and citation rates, while those in the lower left quadrant exhibit lower than average rates for both arrests and citations. [3]

The panels in the second row of Figure 2 describe the search rate per 100 stops and the contraband hit rate per search, as well as the mean for these rates across all agencies. Agencies in the lower right quadrant conduct relatively few searches with higher contraband hit rates. Agencies in the upper left quadrant conduct relatively more searches with fewer contraband hit rates. The agency detail reports replicate Figure 2 and highlight the location of each agency in the figure.

DATA LIMITATIONS FOR COMPARING DIFFERENCES

When comparing these summary metrics across agencies or different population groups, several caveats must be considered. First, driving patterns and the composition of the driving population vary across communities. Second, traffic enforcement, the frequency of calls to police, and discretionary stops and searches also vary across agencies. Consequently, agencies may exhibit different stop rates or search rates due to the composition of drivers encountered by the agency, the enforcement policies implemented by the agency, or some combination of these and other factors.

For example, traffic stops that are the result of investigative stops or emergency calls may generate higher arrest rates than stops resulting from the enforcement of speed limits. Similarly, an arrest will almost always lead to a search, while searches of motorists during routine traffic stops are likely more rare and highly discretionary. Any comparison of search rates and hit rates must then consider the frequency of discretionary searches. As more agencies report incident-level data, accounting for such distinctions may become possible in subsequent reports.

The same caveats apply when examining disparities in traffic stops and resulting outcomes across racial and ethnic groups. Observed differences may result from differential impacts of policing, differential treatment by police, or some combination of these and other factors. Differential impact refers to sources of disparities that are not a direct result of bias on the part of officers conducting vehicle stops. An example of differential impact would be if one population group has more outstanding warrants on average, then that group would have a higher arrest rate not because officers' actions were different with respect to each group, but because the same enforcement action, arresting drivers with outstanding warrants, disproportionately impacts one group more than another. Similarly, existing patterns of residential concentrations by race may result in a differential impact of policing across racial and ethnic groups if officers more intensively patrol some beats due to more calls for service, higher crime rates, or other factors.

The sources of disparate impacts are themselves of interest and should be considered by policymakers and the public, but they are not the direct result of differential treatment by officers conducting vehicle stops. Consequently, the presence of large or persistent disparities is not necessarily an indication of bias in policing. For these reasons, no single metric is capable of identifying or disproving bias in policing. Instead, these data are presented for the purpose of informing a continuing conversation among the public and policymakers regarding differences in traffic stops and outcomes across agencies, as well as the sources of disparities in these measures across racial and ethnic groups.

DIFFERENTIAL HIT RATES

In addition to the metrics described in Table 1 above, a frequently employed proxy for bias in searches is the difference in contraband "hit rates" across groups. The logic of comparing hit rates is as follows: i) if discretionary searches are conducted for the purpose of discovering contraband, and ii) police search motorists only when they estimate that the probability of finding contraband exceeds some threshold (e.g., 30%), then unbiased search behavior will result in a hit rate that is equalized across groups, although search rates may vary across groups. For example, if one group is more likely to possess contraband, then unbiased search behavior will lead to a higher search rate for that group, until the probability of finding contraband is equalized across different groups. Consequently, differences in hit rates are an indicator of differential treatment, while differences in search rates are not necessarily an indicator of differential treatment.

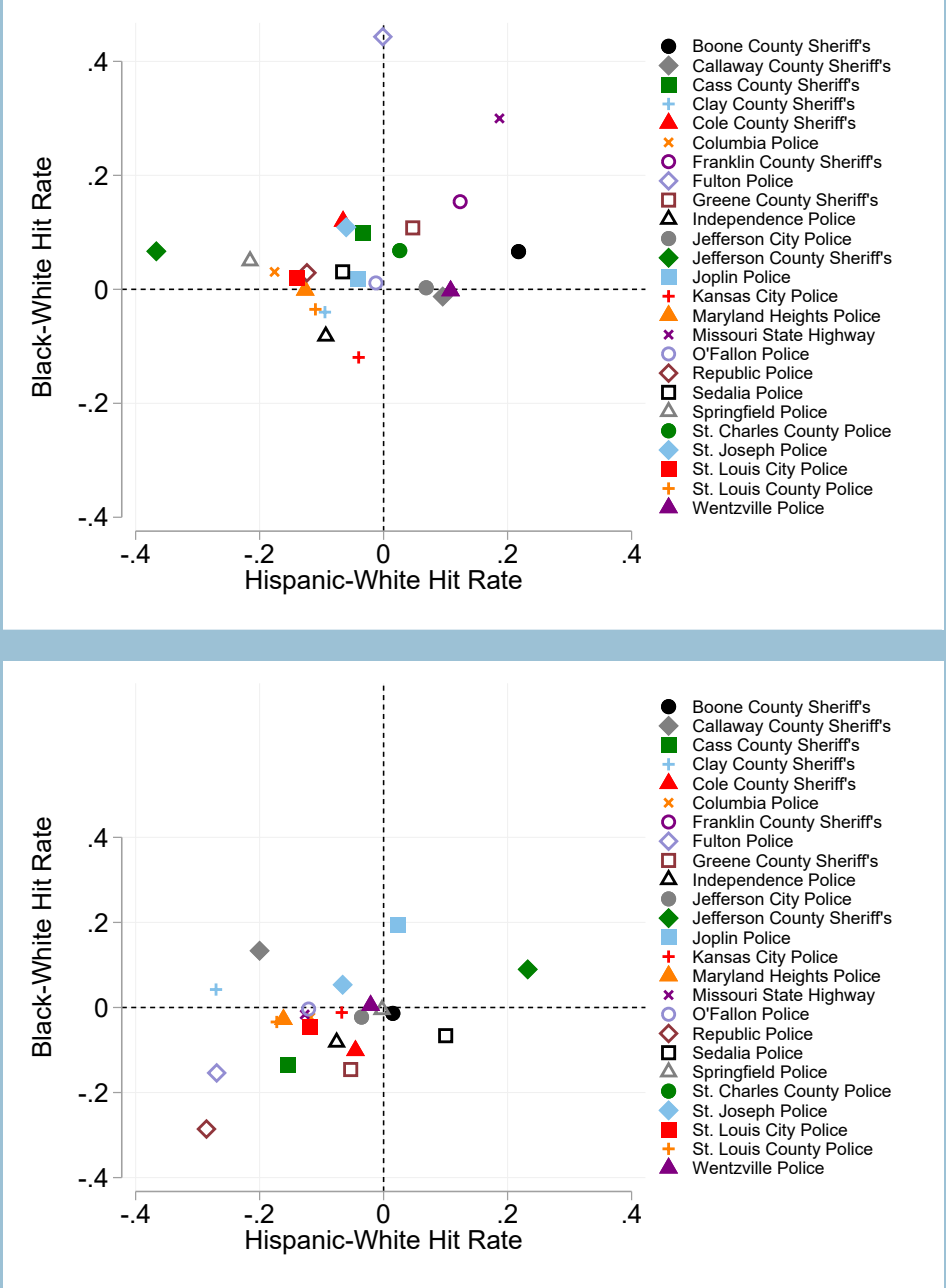
The analytical benefit of differential hit rates is based on the maintained assumption that searches are discretionary. However, this is not always the case. As an example, many agencies have a policy of searching any individual being arrested for obvious reasons of officer safety and investigative integrity. Thus, a high number of arrests might skew the hit rate with non-discretionary searches. The aggregate data reported by most agencies does not allow for any distinction between discretionary and non-discretionary searches, but as more agencies report incident-level data, such a distinction will be feasible. Yet another consideration is that large differences in search rates across groups may be considered problematic even if hit rates are equalized across racial and ethnic groups, since searches are invasive. For this reason, it is useful to consider the frequency of searches alongside hit rates. Finally, because searches are relatively infrequent, a comparison of differential hit rates is not informative unless there are a sufficient number of searches conducted for each population group.

[3] Agencies that conduct very few stops will be more likely to cluster at quotients of small values, such as 0, 0.5, and 1 for the arrest and citation rates.

[4] Agencies that conduct very few searches will be more likely to cluster at quotients of small values, such as 0, 0.5, and 1 for the search and hit rates. This effect is particularly noticeable in the non-White search and hit rate charts due to smaller raw counts of searches for this population.

FIGURE 3:

RELATIVE HIT RATES FOR THE TOP 25 AGENCIES WITH THE MOST SEARCHES



Notes: The race specific hit rate is calculated as the number of searches that find contraband divided by the total number of searches for a specific race. The difference between the Black and White hit rates and the Hispanic and White hit rates are plotted on the y- and x-axis, respectively.

Figure 3 shows the differential hit rates for the 25 largest agencies in the state by the number of searches; the same agencies are shown for two snapshots in time: 2020 (in panel a) and 2010 (in panel b). The data are plotted such that the lower-left quadrant is associated with theoretical "over-searching" the Black and Hispanic population relative to the White population, while the upper-right quadrant is associated with theoretical "over-searching" the White population relative to the Black and Hispanic population. If all searches are discretionary, then unbiased searches would result in all agencies being located at the origin in the figures (0,0). However, deviations from the center are expected, since not all searches are discretionary. Consequently, the location of a given agency in these figures is not necessarily an indication of bias in searches by police, but persistent outliers may warrant further examination.

Looking across the two panels of Figure 3, it is apparent that differential hit rates have drifted over time away from the lower-left quadrant associated with theoretical over-searching of Black and Hispanic motorists, and toward the upper-right quadrant associated with theoretical under-searching of Black and Hispanic motorists. However, this apparent shift is based only on these two snapshots in time, so it may be the result of random variation in the data as opposed to a persistent trend. Future reports will explore patterns in differential hit rates over time and across agencies in more detail. And as more agencies report incident-level data on stops, it will be possible to calculate differential hit rates using only the subset of discretionary searches.

DISPARITY INDEX

Another measure that has been examined in previous reports is the "Disparity Index," or the ratio of a particular group's share of traffic stops divided by that group's share of the population. For example, if 100% of traffic stops involve Black drivers, but the Black percentage in the associated population is only 10%, then the Disparity index would be 10 for that hypothetical case.

When the Disparity Index is equal to 1, then the reference group is represented equally in both traffic stops and population. For values greater than 1, the reference group is over-represented in traffic stops relative to the population. Consequently, the Disparity Index is a summary measure that captures the same information that can be gleaned by looking at stop rates across groups. However, as a measure of disparities, the Disparity Index is highly problematic because: i) it is sensitive to the choice of the benchmark population; ii) as a ratio, it is affected by changes in both the numerator and denominator; and iii) it is not meaningful to compare the Disparity Index across communities with different percentages of minority populations.

First, the relevant benchmark population for analyzing disparities in traffic stops is the population of motorists in the agency jurisdiction, but such data is not feasible to collect. Instead, the Disparity Index is calculated using the residential population characteristics of the community associated with the agency jurisdiction. Population data of this sort is a rough proxy for the characteristics of motorists, but the correlation between this proxy and the driving population falls if some demographic groups drive more frequently than others, or if large numbers of traffic stops involve drivers from outside the local community. For this reason, agencies are now asked to report whether a traffic stop involves a resident or non-resident and analysis of this year's responses reveals that on average on 35% of agencies' traffic stops involve jurisdiction residents. To see how this dynamic affects agencies' disparity index calculation, a resident-only Disparity Index is calculated alongside a Disparity Index for all stops.

Second, the choice of data source for measuring population characteristics in a community will also affect the calculated Disparity Index. For example, if decennial census data is used for the benchmark population, then changes in the demographic make-up of a community will not be captured for years between census reports. As a result, the numerator of the Disparity Index will be affected by changing demographics over time, but the denominator will not. This is especially problematic for communities with rapid population changes. For this reason, the source of population characteristics used in this report is the most recent five-year estimate of local population from the 2019 American Community Survey. In general, the choice of data source for calculating a Disparity Index is more consequential for relatively small demographic groups (see the Appendix for a more detailed discussion).

Third, because it is a ratio, the Disparity index is also problematic for making comparisons across communities. For example, the maximum value of the Disparity Index varies with the reference group's share of the population. In other words, the larger the share of population for a given group, the lower the maximum possible Disparity Index is for that group. Reconsider the example above when 100% of traffic stops involve Black drivers, but now the community population is 50% Black (instead of 10%). The Disparity Index will now be 2 (versus 10), even though in both cases, only Black drivers are stopped. For this reason, it is not informative to compare Disparity Indices across communities with very different population shares (or over time in a community with changing population shares).

Finally, as with the other metrics of disparities discussed above, the Disparity Index is not informative regarding the possible existence of bias in policing. Disparities may be generated by many other factors, including:

- Policing strategies and policies: Law enforcement officials make strategic choices on where and when to police that may disproportionately impact various racial/ethnic groups. Strategies such as concentrating patrols in areas within a city with higher crime rates, could lead to a disproportionate impact if that area has a higher concentration of a racial/ethnic group than the jurisdiction as a whole.

- Differences in real rates of offending between racial/ethnic groups: The correlation of dynamics such as economic or social disadvantage with race or ethnicity may lead to differences in rates of real offending. If there are real differences in offending rates, traffic stops should theoretically increase or decrease accordingly.

- Incorrect population benchmark: Estimated population characteristics may not accurately measure the racial and ethnic composition of drivers. Further, changes in population demographics may not be fully captured in population estimates

For these reasons, changes in the value of the Disparity Index over time are not informative about changes in the prevalence of bias in traffic stops. In other words, it is possible for bias in traffic stops to be decreasing even though the Disparity Index is rising due to changing demographics or policing patterns. The converse is also

TABLE 2:
DISPARITY INDEX FOR MISSOURI

Table 2 shows the Disparity Index for each racial and ethnic group, using both all traffic stops and only stops of residents. The population shares for each group are taken from the most recent American Community Survey conducted by the U.S. Census Bureau. Table 3 shows the Disparity Index for every year that this report has been generated. However, previous versions of this report have employed different sources for population estimates, so caution should be used when comparing Disparity Index values over time (see the notes to Table 3 and the Appendix).

	Total	White	Black	Hispanic	Native American	Asian	Other
Population (16+)							
2019 Population	4,881,733	3,964,827	539,702	170,858	22,504	99,131	143,442
2019 population %	100	81.22	11.06	3.5	0.46	2.03	2.94
2020 Stops							
All stops	1,162,905	897,674	209,222	29,711	1,979	10,349	13,970
Resident stops	589,388	475,184	92,097	12,891	768	4,269	4,179
Disparity index							
All stops	-	0.95	1.627	0.73	0.369	0.438	0.409
Resident stops	-	0.993	1.413	0.625	0.283	0.357	0.241

Notes: 2019 Disparity index is based on 2015-2019 average population estimates from the U.S. Census Bureau's American Community Survey (ACS) for ages 16+ for Missouri. The ACS only provides race-specific Hispanic estimates for White, meaning non-White Hispanic residents are double-counted in the 2019 race percentages above.
Disparity index = (proportion of stops / proportion of population). A value of 1 indicates no difference between the share of stops and share of local population for a given group. Values greater than one indicate over- representation in the share of stops relative to local population, while a value less than 1 indicates under-representation.

The Disparity Index for traffic stops and the Black population has been consistently greater than one and has generally been on the rise over time. This pattern is also captured in Figure 4, which plots the values in Table 3 over time (the vertical lines in Figure 4 indicate a change in the source for population used in calculating the Disparity Index). Again, the recent decrease in the value of the Disparity Index for the Black population likely reflects multiple factors, including changing population shares between the 2010 census data employed in last year's report and the 2019 ACS population estimates employed in this report.

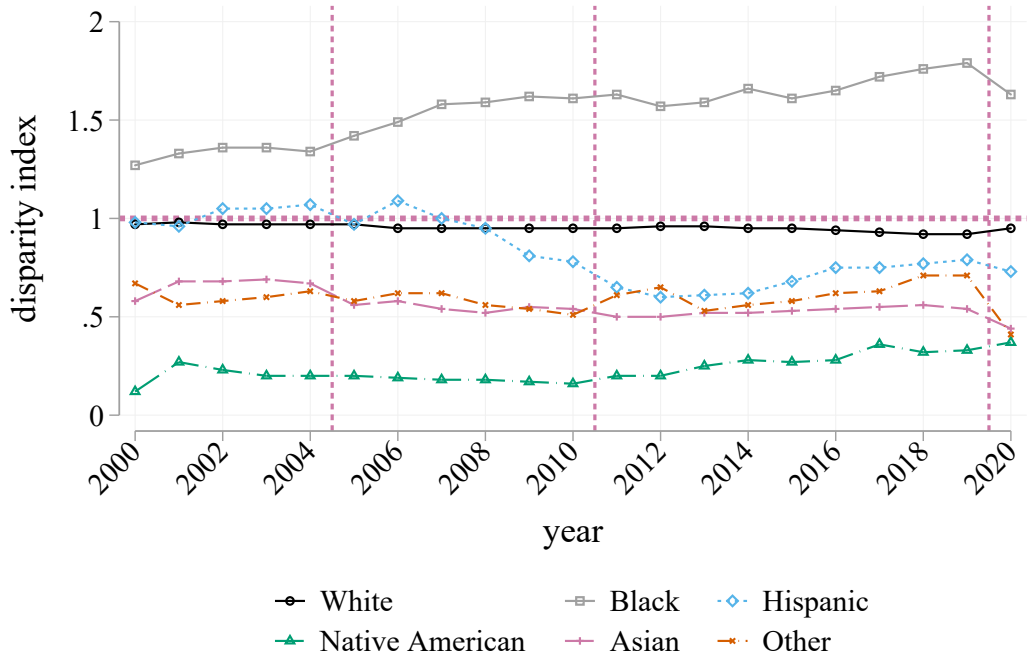
TABLE 3:
DISPARITY INDEX FROM 2000 TO 2020 FOR MISSOURI

	White	Black	Hispanic	Native American	Asian	Other
2000	0.97	1.27	0.98	0.12	0.58	0.67
2001	0.98	1.33	0.96	0.27	0.68	0.56
2002	0.97	1.36	1.05	0.23	0.68	0.58
2003	0.97	1.36	1.05	0.2	0.69	0.6
2004	0.97	1.34	1.07	0.2	0.67	0.63
2005	0.97	1.42	0.97	0.2	0.56	0.58
2006	0.95	1.49	1.09	0.19	0.58	0.62
2007	0.95	1.58	1	0.18	0.54	0.62
2008	0.95	1.59	0.95	0.18	0.52	0.56
2009	0.95	1.62	0.81	0.17	0.55	0.54
2010	0.95	1.61	0.78	0.16	0.54	0.51
2011	0.95	1.63	0.65	0.2	0.5	0.61
2012	0.96	1.57	0.6	0.2	0.5	0.65
2013	0.96	1.59	0.61	0.25	0.52	0.53
2014	0.95	1.66	0.62	0.28	0.52	0.56
2015	0.95	1.61	0.68	0.27	0.53	0.58
2016	0.94	1.65	0.75	0.28	0.54	0.62
2017	0.93	1.72	0.75	0.36	0.55	0.63
2018	0.92	1.76	0.77	0.32	0.56	0.71
2019	0.92	1.79	0.79	0.33	0.54	0.71
2020	0.95	1.63	0.73	0.37	0.44	0.41

Notes: In the years 2000 - 2004 the disparity index was calculated using the 2000 Decennial Census (ages 16+), 2005 - 2010 uses the annual updates from Geolytics Inc, and 2011 - 2019 use the 2010 Decennial Census for persons (ages 16+). Hispanics may be of any race. Other includes persons of two or more races or unknown race. The 2020 disparity index is based on the most recent 5-year population estimates from the American Community Survey (ages 16+) for Missouri.

Disparity index = (proportion of stops / proportion of population). A value of 1 indicates no difference between the share of stops and share of local population for a given group. Values greater than one indicate over-representation in the share of stops relative to local population, while a value less than 1 indicates under-representation.

TABLE 4: DISPARITY INDEX FROM 2000 TO 2020 FOR MISSOURI



Notes: In the years 2000 - 2004 the disparity index was calculated using the 2000 Decennial Census (ages 16+), 2005 – 2010 uses the annual updates from Geolytics Inc, and 2011 - 2019 use the 2010 Decennial Census(ages 16+). Hispanics may be of any race. Other includes persons of two or more races or unknown race. The 2020 disparity index is based on the most recent 5-year population estimates from the American Community Survey (ages 16+) for Missouri. Changes in the population are noted by the vertical dashed lines before 2005, 2011, and 2020.

Disparity index = (proportion of stops / proportion of population). A value of 1 indicates no difference between the share of stops and share of local population for a given group. Values greater than one indicate over-representation in the share of stops relative to local population, while a value less than 1 indicates under-representation.

Tables 4 and 5 provide more detailed information on traffic stops, also broken down by race and ethnic group. The agency reports follow the same presentation format as shown here, but exclude the figures showing differential hit rates by community.

TABLE 4:
NUMBERS OF STOPS BY RACE FOR MISSOURI

	Total	White	Black	Hispanic	Native American	Asian	Other
All Stops	1,162,905	897,674	209,222	29,711	1,979	10,349	13,970
Resident Stops	589,388	475,184	92,097	12,891	768	4,269	4,179
Non-Resident Stops	573,517	422,490	117,125	16,820	1,211	6,080	9,791
Reason for Stop							
Moving	699,894	539,406	122,315	20,879	1,280	7,738	8,276
Equipment	156,533	123,329	26,150	3,462	292	1,104	2,196
License	307,746	232,942	64,322	5,278	418	1,494	3,292
Investigative	41,579	29,565	9,846	985	67	241	875
Stop Outcome							
Searches	95,501	74,478	17,882	2,268	137	304	432
Contraband	28,961	20,275	7,547	798	59	119	163
Arrests	44,762	33,230	9,636	1,427	65	174	230
Citation	548,109	393,395	126,937	16,909	817	5,034	5,017
Warning	864,783	701,519	122,186	21,948	3,296	7,308	8,526
No Action	40,262	28,298	9,767	1,226	69	389	513
Location of Stop							
Interstate Hwy	178,119	122,189	43,376	7,972	326	2,661	1,595
US Hwy	182,796	152,937	22,090	4,863	385	1,392	1,129
State Hwy	257,718	220,452	27,023	5,504	431	1,856	2,452
County Road	72,375	52,543	17,025	901	96	595	1,215
City Street	410,750	305,424	85,852	9,853	645	3,384	5,592
Other	57,779	40,875	13,811	575	82	454	1,982
Driver Gender							
Male	720,895	553,824	127,814	21,950	1,322	6,683	9,302
Female	441,351	341,696	81,432	7,714	657	3,660	6,192
Driver Age							
17 and Under	46,563	39,856	4,675	1,055	67	305	605
18-29	438,541	319,497	95,835	13,048	772	3,825	5,564
30-39	275,776	207,612	53,597	7,993	523	2,500	3,551
40 and Over	395,084	324,366	54,718	7,425	585	3,656	4,334

Notes: Data reported by the agency to the Attorney General's Office covering all traffic stops in 2020.

TABLE 5:
SEARCH STATISTICS FOR MISSOURI

	Total	White	Black	Hispanic	Native American	Asian	Other
Probable Cause							
Consent	37,409	29,346	6,673	1,004	64	125	197
Inventory	6,061	4,515	1,240	208	11	34	53
Drug/Alcohol Odor	18,037	10,122	7,147	559	36	69	104
Incident to Arrest	23,516	16,889	5,535	820	39	106	127
Plain View Contra.	6,262	4,393	1,640	168	12	29	20
Reas. Susp-Weapon	2,469	1,449	927	66	2	13	12
Drug-Dog Alert	2,572	2,099	371	80	-	8	14
Other	1,627	1,211	368	28	4	5	11
What Searched							
Driver	13,218	9,707	2,830	522	25	65	69
Car/Property	15,009	11,062	3,215	541	27	77	87
Driver & Property	49,288	35,675	11,859	1,226	85	160	283
Search Duration							
0-15 Minutes	68,902	49,925	16,181	2,023	116	284	373
16-30 Minutes	8,592	6,706	1,575	220	15	24	52
31+ minutes	1,338	1,059	201	59	5	7	7
Contraband Found							
Drugs/Alcohol	33,280	24,342	7,725	871	65	125	152
Currency	452	255	164	24	1	7	1
Weapon	2,968	1,477	1,406	60	3	8	14
Stolen Property	906	621	253	20	4	1	7
Other	697	551	114	23	2	3	4
Arrest Charge							
Outstanding Warrant	16,454	11,259	4,704	341	31	42	77
Drug Violation	12,635	9,658	2,579	278	25	39	56
Resist Arrest	1,718	1,121	533	46	1	5	12
Off Against Person	1,071	702	333	24	6	4	2
Traffic Violation	26,485	21,242	4,119	774	69	141	140
DWI/BAC	11,693	9,103	1,827	563	21	91	88
Property Offense	1,625	1,068	522	24	3	2	6
Other	8,259	6,459	1,434	216	30	47	73

Notes: Data reported by the agency to the Attorney General's Office covering all traffic stops in 2020.

NON-COMPLIANT AGENCIES

- Berger Police Dept.
- Blackburn Police Dept.
- Breckenridge Hills Police Dept.
- Bucklin Police Dept.
- Butterfield Police Dept.
- Clarkson Valley Police Dept.
- Claycomo Police Dept.*
- Cooter Police Dept.
- Des Peres Police Dept.*
- East Prairie Police Dept.
- Eminence Police Dept.
- Fairview Police Dept.*
- Flordell Hills Police Dept.
- Frankford Police Dept.*
- Freeman Police Dept.
- Goodman Police Dept.
- Henrietta Police Dept.*
- Iron Mountain Lake Police Dept.
- King City Police Dept.
- Lake Waukomis Police Dept.
- Lilbourn Police Dept.
- Linn Creek Police Dept.
- Miller Police Dept.
- New Franklin Police Dept.
- Risco Police Dept.
- Rutledge Police Dept.
- St. Mary Police Dept.
- Stewartsville Police Dept.
- Summersville Police Dept.
- Urbana Police Dept.
- Vandalia Police Dept.
- Winona Police Dept.
- Wood Heights Police Dept.

* Agency did not submit data by the statutory deadline, but did provide data for inclusion in the report.

AGENCIES WITH ZERO STOPS

- Annapolis Police Dept.
- Armstrong Police Dept.
- Belle Police Dept.
- BNSF Railway Police
- Bunker Police Dept.
- Camden Police Dept.
- Centerview Police Dept.
- Crystal Lakes Police Dept.
- Dudley Police Dept.
- Edgerton Police Dept.
- Ellington Police Dept.
- Forest City Police Dept.
- Garden City Police Dept.
- Jackson County Drug Task Force
- Jefferson College Police Dept.
- Keytesville Police Dept.
- Metropolitan Community College Police Dept.
- Mineral Area College DPS
- Missouri Department of Revenue
- Terminal Railroad
- Association of St. Louis
- Vanduser Police Department
- Wardell Police Dept.

APPENDIX
POPULATION DATA

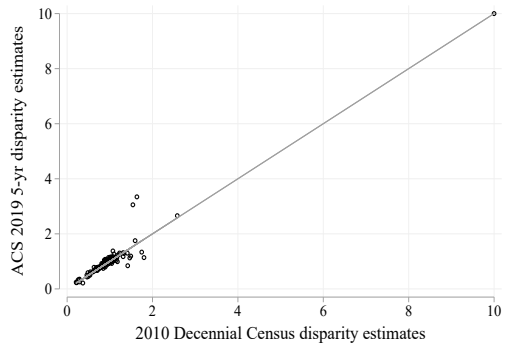
As discussed in the report, population estimates factor into the calculation of the Disparity Index. Thus, it is important to use the most accurate population estimates available. In this report, the 2019 5-year American Community Survey population estimates are used for each agency. However, past reports have used other estimates, which makes year to year comparisons difficult. Specifically, the 2011-2019 reports used population estimates from the 2010 Decennial Census, which were more accurate earlier in the decade and gradually became outdated in later years. It is important to note that some of the changes in the Disparity Index, either positive or negative, are due to both changes in traffic stops and the change in the population estimates.

Figure 5 plots the 2020 Disparity Index calculated using both the 2019 ACS and 2010 Decennial population for each agency by race. The 45-degree line indicates where the two indices are the same. Points above the line are agencies with a higher Disparity Index using the more recent population estimates, while points below the line are agencies with a higher Disparity Index using the 2010 population estimates. [5] The prevalence of agencies below the line for many racial/ethnic groups, particularly Blacks, suggests that many agencies' disparity indices may have been driven higher by increasing diversity in their residential populations since the last decennial census, though this is not the case for all agencies as there are many above the line as well.

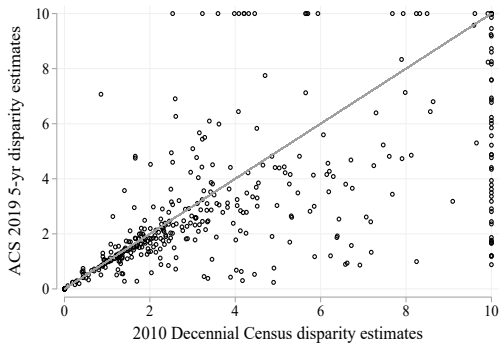
[5] The Disparity Index is truncated at 10 to make the graphs more readable, which creates some of the observed clustering along the perimeter of the figures.

FIGURE 5:
DIFFERENCES BETWEEN DISPARITY INDICES USING DECENNIAL 2010 & AMERICAN COMMUNITY SURVEY 2019

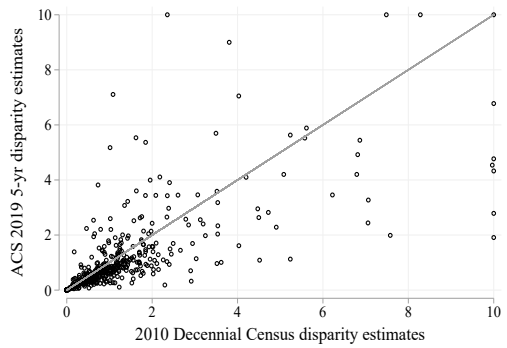
(a) White



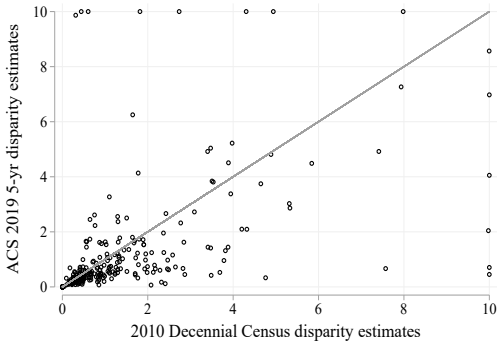
(b) Black



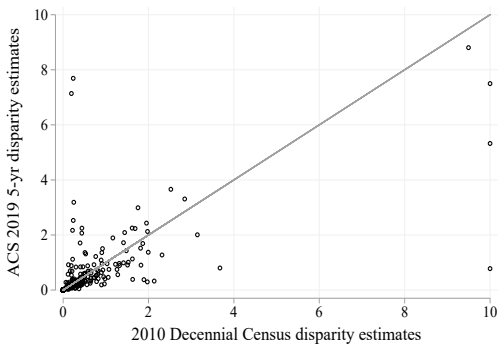
(c) Hispanic



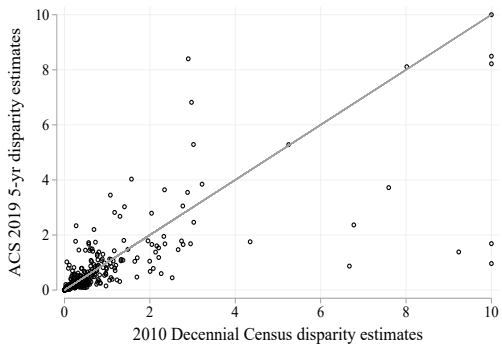
(d) Asian



(e) Native American



(f) Other



Notes: The disparity indices based on the population estimates from the five-year 2019 American Community Survey for ages 16+, used in this report, and the 2010 Decennial Census for ages 15+ are plotted on the y- and x-axis, respectively. A 45-degree line is plotted in each graph depicting the line of equality between the two measures. Each dot represents an agency. The disparity indices are truncated at 10 for visualization purposes.

It is also noted in the report that the ACS only provides race-specific Hispanic estimates for White, meaning non-White Hispanic residents are double-counted in the 2019 race-specific estimates used. This occurs because Hispanic is an ethnic category; thus, any race (White, Black, Asian, Native American, or Other) may be reported in conjunction with Hispanic. For example, a person identifying as Hispanic and White will be classified only as Hispanic; however, an individual identifying as Hispanic and Black will contribute to both Hispanic and Black population estimates, leading to double counting.

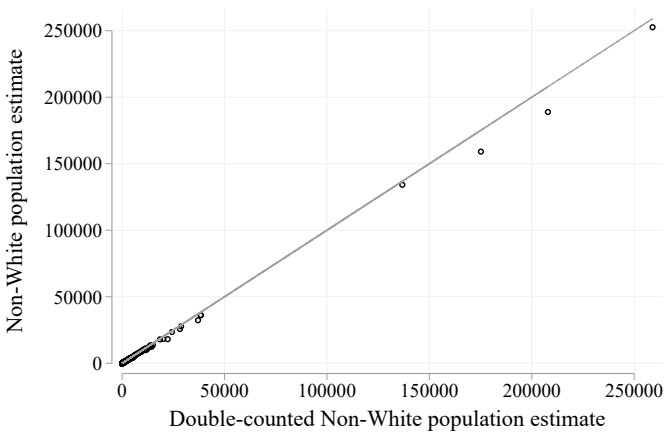
To investigate the extent of this issue, two measures of the Non-White population estimates are compared in Figure 6 Panel A. The first measure, plotted on the y-axis, is calculated as the total population minus the White population, which is not double-counted with Hispanic, providing a total population estimate of the Non-White population that avoids any double-counting within races. The second measure adds up the population estimates of all non-white groups, including double counting as previously discussed, and is plotted on the x-axis. Points are expected to be on or below the 45-degree line, indicating no double counting or some positive double-counting, respectively.

Figure 6 Panel B plots the degree of double counting as the share of the Non-White population for each agency. Roughly 35% of agencies do not have any double counting, as seen in the figure. One agency has an estimated Non-White population of 8 persons, and all are double-counted (indicated by the bar at 100), meaning individuals responding to the American Community Survey identified as both non-white and Hispanic. Figure 6 suggests the non-White Hispanic double counting is limited for the majority of agencies.

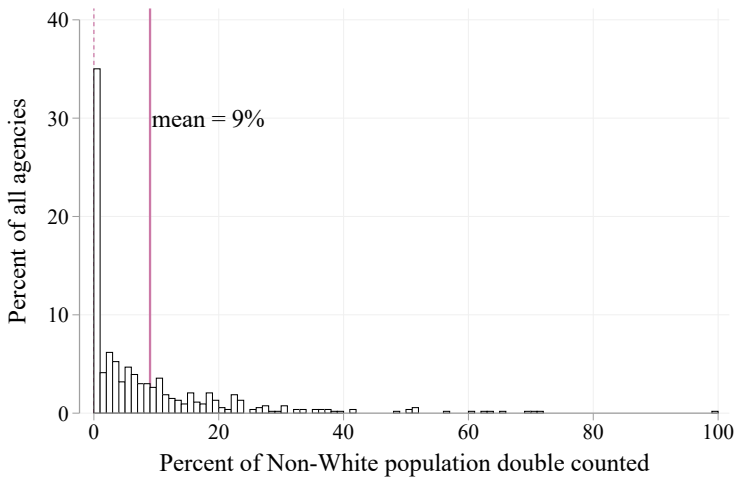
FIGURE 6:

DOUBLE COUNTING OF THE NON-WHITE HISPANIC POPULATION IN THE ACS POPULATION ESTIMATES

(a) Degree of double counting within Non-White population



(b) Percent of Non-White population double counted



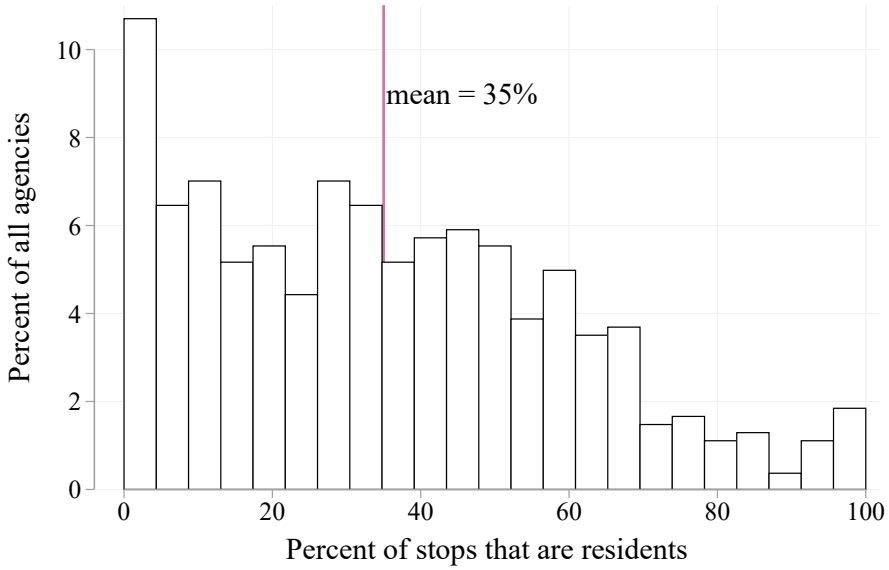
Notes: Population is measured using the 2019 American Community Survey 5-year estimates. The ACS only provides race-specific Hispanic estimates for White. To avoid double counting, we calculate the total non-White population as the total population minus the Non-Hispanic White population for each agency. We then compare this to the sum of the Non-White, race specific population estimates to illustrate the degree of double counting due to non-white and Hispanic races overlapping in the ACS estimates for each agency. Each dot represents an agency, with the Missouri State high way Patrol not included.

Resident Classification

A distinction is made in the report between resident and non-resident stops. This distinction is also relevant for interpreting the Disparity Index, as stops are compared to the demographic breakdown of the agencies' population. For this reason, a new question was added in 2017, specifying whether the stop was a resident or non-resident stop.

FIGURE 7:

SHARE OF TOTAL AGENCY STOPS THAT ARE RESIDENT STOPS



Notes: This figure depicts the fraction of stops that are categorized as resident stops for each agency, except the Missouri State Highway Patrol and agencies not matched to a local population (e.g. university police).

Figure 7 depicts the percentage of agencies with various shares of resident stops. For many agencies, the majority of stops are non-residents, with residents accounting for 35% of stops for the average agency. A few caveats apply when interpreting this data, particularly for the agencies at the two extremes of the distribution. First, since this is a relatively new question, some agencies have not yet included it on their form. These agencies were instructed to report all stops as resident stops for reporting purposes, i.e., 100% of stops are classified as resident stops. This convention prevents the residential disparity indices from being artificially affected since no stops were filtered from the calculation. Second, to the extent that drivers do not update their driver's license in a timely manner, there may be an undercounting of resident stops.[6] Finally, due to data aggregation, stops where the question is not answered on the form is likely counted as a non-resident stop by default, which may lead to undercounting of resident stops for some agencies. [7]

[6] There is likely variability in how this question is filled out on the form across agencies. Many likely use the address on the driver's license to avoid problematic questioning during the traffic stop; however, that may not be the case for all agencies.

[7] The question is 1 = resident and 0 = non-resident; however, it is common for data to be treated as 1 for yes and 0 otherwise, in which missing data is defaulted as the 0 response, especially when aggregating data.

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